

Application No. 10/089,364
Amendment dated March 7, 2006
Reply to Office Action of September 8, 2005

Amendments to the Claims:

The listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Previously amended) A method of enhancing the phosphorus nutrition of a plant, comprising the step of growing said plant in a medium comprising phytate, wherein the plant ectopically expresses in its roots an isolated nucleic acid molecule encoding a phytase polypeptide and said phytase polypeptide is secreted from the roots, wherein said phytase polypeptide comprises an amino acid sequence having at least 95% identity to SEQ ID NO: 4, and wherein said plant has enhanced phosphorus nutrition relative to an isogenic non-transformed plant.
2. (Previously amended) The method according to claim 1 wherein the secretion of said phytase from the roots is achieved by ectopically expressing the phytase as a fusion protein with a secretory signal peptide.
3. (Original) The method according to claim 2 wherein the secretory signal peptide is selected from the group consisting of the carrot extensin signal peptide and the lupin acid phosphatase signal peptide.
4. (Original) The method according to any one of claims 1 to 3 wherein the phytase polypeptide is from *Aspergillus niger*.
5. (Canceled)

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6. (Previously amended) The method according to claim 1 wherein the phytase polypeptide comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 2 and SEQ ID NO: 4.
7. (Previously amended) The method according to claim 1 wherein the phytase polypeptide is encoded by a nucleotide sequence selected from the group consisting of SEQ ID NO: 1, SEQ ID NO: 3, and a degenerate nucleotide sequence thereto.
8. (Previously amended) The method according to claim 1 wherein the phytase polypeptide is encoded by a nucleotide sequence contained within the plasmid assigned AGAL Accession No. NM99/06795.
9. (Previously amended) A method of enhancing the phosphorus nutrition of a plant, comprising the step of growing said plant in a medium comprising phytate, wherein said plant ectopically expresses in its roots an isolated nucleic acid molecule encoding a fusion polypeptide between a secretory signal peptide and a phytase polypeptide and said fusion polypeptide is secreted from the roots, wherein said isolated nucleic acid comprises a nucleotide sequence selected from the group consisting of SEQ ID NO: 9, SEQ ID NO: 11, the phytase-encoding nucleotide sequence contained in the plasmid assigned AGAL Accession No. NM99/06795, and degenerate nucleotide sequences thereto, and wherein said plant has enhanced phosphorus nutrition relative to an isogenic non-transformed plant.
10. (Previously amended) The method according to claim 9 wherein the fusion polypeptide comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 10 and SEQ ID NO: 12.

11-25 (Canceled)

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26. (Previously amended) A transformed plant growing in a medium comprising phytate, wherein said plant ectopically expresses in its roots an isolated nucleic acid molecule encoding a phytase polypeptide and said phytase polypeptide is secreted from the roots, wherein said phytase polypeptide comprises an amino acid sequence having at least 95% identity to SEQ ID NO: 4, and wherein said plant has enhanced phosphorus nutrition relative to an isogenic non-transformed plant growing in said medium.
27. (Previously amended) A progeny plant of the transformed plant of claim 26, wherein said progeny plant is growing in a medium comprising phytate, and wherein said progeny plant ectopically expresses in its roots said isolated nucleic acid molecule and said phytase polypeptide is secreted from the roots.
28. (Previously amended) A transformed plant growing in a medium comprising phytate, wherein said plant ectopically expresses in its roots an isolated nucleic acid molecule encoding a fusion polypeptide between a secretory signal peptide and a phytase polypeptide and said fusion polypeptide is secreted from the roots, wherein said isolated nucleic acid comprises a nucleotide sequence selected from the group consisting of SEQ ID NO: 9, SEQ ID NO: 11, the phytase-encoding nucleotide sequence contained in the plasmid assigned AGAL Accession No. NM99/06795, and degenerate nucleotide sequences thereto, and wherein said plant has enhanced phosphorus nutrition relative to an isogenic non-transformed plant growing in said medium.
29. (Previously amended) A progeny plant of the transformed plant of claim 28 wherein said progeny plant is growing in a medium comprising phytate, and wherein said progeny plant ectopically expresses in its roots said isolated nucleic acid molecule and said phytase polypeptide is secreted from said roots.

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30. (Previously amended) The transformed plant of claim 26 or 28 wherein said plant exhibits an increased biomass relative to an isogenic plant that does not ectopically express the phytase polypeptide.
31. (Previously amended) The progeny plant of claim 27 or 29 wherein said progeny plant exhibits an increased biomass relative to an isogenic plant that does not ectopically express the phytase polypeptide.
- 32- 36 (Canceled)
37. (Previously amended) The transformed plant of claim 26 or progeny plant of claim 27 wherein the phytase polypeptide is ectopically expressed as a fusion protein with a secretory signal peptide.
38. (Previously amended) The transformed plant or progeny plant according to claim 37, wherein the secretory signal peptide is selected from the group consisting of the carrot extensin signal peptide and the lupin acid phosphatase signal peptide.
39. (Previously amended) The transformed plant of claim 26 or progeny plant of claim 27 wherein the phytase polypeptide is from *Aspergillus niger*.
40. (Canceled)
41. (Previously amended) The transformed plant of claim 26 or progeny plant of claim 27 wherein the phytase polypeptide comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 2 and SEQ ID NO: 4.
42. (Previously amended) The transformed plant of claim 26 or progeny plant of claim 27 wherein the phytase polypeptide is encoded by a nucleotide sequence

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selected from the group consisting of SEQ ID NO: 1, SEQ ID NO: 3 and a degenerate nucleotide sequence thereto.

43. (Previously amended) The transformed plant of claim 26 or progeny plant of claim 27, wherein the phytase polypeptide is encoded by a nucleotide sequence contained within the plasmid assigned AGAL Accession No. NM99/06795.

44-49 (Canceled)

50. (Previously added) The transformed plant or progeny plant of claim 37, wherein the fusion protein comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 10 and SEQ ID NO: 12.
51. (Previously amended) The method according to claim 1, wherein the medium comprises a plant fertilizer comprising phytate.